A Structural Model of Motivational Beliefs in Effort and Ability, Goals Orientation and Learning Strategies of Hong Kong Teacher Education Students

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Abstract
It had been argued and debated quite for a long time by local researchers whether motivational beliefs in effort and ability would have significant effects on students' achievement goals and learning behaviors. In fact, a key factor related to cultural differences in the service and support of education would be the relative emphasis that culture would value/place on innate ability and effort. According to Weiner (1986), students who attributed success/failure to effort were more likely to incline to working harder than a student who attributed success/failure to innate ability. Popular and favorite Chinese saying: "Genius comes from hard work and knowledge depends on accumulation" (Tong, Zhao, & Yang, 1985) as well as the Chinese proverb: "The slow bird needs to start out early" both clearly explained that effort and innate ability would induce and lead to different achievement outcomes. Hau & Salili (1990) studied the causal attributions and achievement goals of primary school students in Hong Kong. Twelve specific causes including effort and ability were provided, and the students were required to rate the importance of each of them with respect to their performance in an actual examination. Results indicated that as compared to the junior students, the senior form students were learning oriented and they attributed their importance more to internal causes such as effort. In another study, Salili & Mak (1988) found that "effort" was perceived by Hong Kong students as the most important antecedents for academic achievement, while "being wealthy" and "career success" the lesser importance. Although these studies had investigated the attribution causes in academic achievements for Hong Kong students, they had not attempted to examine the structural relationships among motivational beliefs, achievement goals and learning strategies which were prevalent factors leading to desirable achievement outcomes. The present study attempted to establish a structural model consisting of the construct of motivational beliefs (effort vs. ability), achievement goal orientations (learning goal vs. performance goal) and learning strategies (rehearsal, elaboration, organization, critical thinking). It was hypothesized that there were significant relationships among motivational beliefs in effort and ability, achievement goals and learning strategies at the p = .05 level. Belief in ability would have positive and significant effect on performance goal. Belief in effort would exert positive and significant effect on learning goal. Around 200 Hong Kong tertiary institute students were invited to participate in the present research. There were three adapted questionnaires on beliefs in effort and ability, achievement goals and learning strategies to be used and were administered to the participants. Findings showed that belief in effort had positive and significant effect on learning goal, whereas belief in ability had positive and significant effect on performance goal. Besides, learning goal orientation had positive and significant effects on rehearsal, elaboration, organization, critical thinking, whereas performance goal orientation had non-significant effects on these learning strategies, except the rehearsal strategy. More importantly, a structural model (utilizing path analysis by LISREL) comprising the complex interrelationships among beliefs in effort and ability, achievement goals and learning strategies could be established and substantiated by empirical data. The findings of the present research could contribute to help widen the knowledge into the characteristics of student teachers' motivation and learning processes. It also deepened the insight into the inter-correlation and complexities of the variables on learning outcomes. Teacher
educators would become more aware of these influential factors affecting the quality of learning outcomes and they would develop improved pedagogical strategies and implement necessary curricular programs to cater for the needs of the student teachers. Hence, the institutional resources and facilities could be adjusted/modified aiming at providing a better environment conducive to more desirable learning outcomes. Implications for further researches with consideration of socio-cultural framework/explanation would be discussed as well.

Introduction

An important and key factor related to cultural differences in the service and support of education would be the relative emphasis the culture places or values on innate ability and effort. A student who attributes success or failure to effort or lack of it is more likely to work harder than a student who attributes success or failure to innate ability (Weiner, 1986). There is favourite quotation of Chinese children saying that “Genius comes from hard work and knowledge depends on accumulation” (Tong, Zhao, & Yang, 1985). This saying clearly reflects the importance of effort over the role of innate ability. Children assumed having lower abilities are “convinced” provided that they can achieve as much as other children if they will work harder. The Chinese proverb “The slow bird needs to start out early” explains clearly that innate abilities are assumed to determine the rate at which one acquires knowledge, but attaining the ultimate level of achievement depends on effort (Chen, Stevenson, Hayward, & Burgess, 1995).

There were quite a number of researches conducted on ethnic and cultural differences in the motivational beliefs in effort and ability. Studies conducted in Hong Kong included the works, e.g., from Hau (1992), Hau and Salili (1989, 1990, 1991) as well as Salili and Mak (1988). They found that “effort” was perceived by Hong Kong students as the most important antecedent for academic achievement, while “being wealthy” and “career success” the lesser importance. Chinese students were taught to be responsible for their own academic performance. In the study by Hau and Salili (1990), they had examined the causal attributions and achievement goals of primary school students in Hong Kong. Twelve specific causes including effort and ability were provided, and the students were required to rate the importance of each of them with respect to their performance in an actual examination. Results indicated that as compared to the junior students, the senior form students were learning oriented and they attributed their performance more to internal causes such as effort.

In an interesting study abroad, Hess, Chang, and McDevitt (1987) investigated family beliefs of children’s performances in China and in the United States in their interviews with mothers and children. They found a gradual change in attribution patterns among the Chinese living in China and the Chinese living in the United States. Chinese mothers in China attributed their children’s failure predominantly to lack of effort whereas Chinese mothers living in the United States considered effort important, but assigned considerable responsibilities to other factors as well. While the Caucasian mothers attributed their children’s failure least to effort.

In sum, local findings such as Salili and Mak’s study (1988), which indicated that Hong Kong students regarded effort as important antecedent for academic achievement, as well as that of Hau and Salili’s (1990) study, which showed senior form students believed significantly in effort for academic success, would suggest the relatively more important “motivational belief in effort” might cause/derive cultural differences in academic achievement. All these findings implicated that there might exist a strong relationship between motivational beliefs with learning behaviours and in particular, effort belief would lead to better academic achievement. These differences in motivational beliefs (effort vs.
ability) might suggest a clue to account for the explanation why Chinese students outperform their counterparts in the western countries. Although these studies had investigated the attribution causes in academic achievements for Hong Kong students and had significant contribution in building up a framework to explain how Chinese students uphold their motivational beliefs leading to desirable achievement outcomes, they had not attempted to examine closely the structural relationships among motivational beliefs (in effort and ability), achievement goals and learning strategies which were prevalent factors leading to desirable achievement outcomes. So, in order to explore further how motivational beliefs may induce different achievement outcomes through the mediational effects derived from achievement goals orientation and learning strategies, the present study would bridge the gap in establishing a structural model consisting of the constructs of motivational beliefs (effort vs. ability), achievement goals orientation (learning goal vs. performance goal) and learning strategies (rehearsal, elaboration, organization, critical thinking). Through the present investigation, the author would like to achieve two main objectives. The first objective was to explore whether motivational belief in effort would exert significant effect on learning goal, and motivational belief in ability would exert significant effect on performance goal. The second objective was to explore the effects of learning goal and performance goal on the learning strategies adopted by the student teachers in Hong Kong.

**Practical Contribution**

At the practical level, since the motivational beliefs, achievement goals and learning strategies would be investigated and their influence on student teachers’ achievement outcomes being explored, the findings would enable us better understand the motivational beliefs and learning characteristics of the student teachers in the Hong Kong. It would therefore help widen the knowledge into the characteristics of student teachers’ motivation and learning processes and also deepen the insight into the inter-correlation and complexities of these variables on learning outcomes. Teacher educators would become more aware of the factors affecting the quality of learning outcomes if they have better understanding of these factors. This would help teacher educators develop better teaching strategies, implementing necessary curriculum programmes to cater for the needs of the student teachers. Hence the institutional resources and facilities could be adjusted and modified aiming at providing a better environment that is conducive to learning. The findings of the present study might also facilitate and support future intervention programmes to help improve and facilitate student teachers’ desirable achievement goals orientation and learning strategies for their pursuit of studies.

**Conceptual Definitions of Variables/Constructs**

Before the research question and hypotheses are being established, it is deemed necessary to define conceptually on the variables to be studied. The followings are the conceptual definitions: (1) Belief in Ability and Effort- the belief in which individuals perceive that effort or ability conducive to academic success; (2) Learning Goal- the personal intention to increase mastery of new tasks and to increase the competence; (3) Performance Goal- the personal intention to maintain a positive judgment of the ability and to strive to avoid negative judgments by trying to prove ones superiority and competence in competing and outperforming others; (4) Rehearsal Learning Strategy- it involves reciting or naming items from a list to be learned; (5) Elaboration Learning Strategy- it helps students store information into long-term memory by building internal connections between items to be learned; (6) Organization Learning Strategy- it helps the learner select appropriate information and construct connections among the information to be learned; (7)
Critical Thinking Learning Strategy - it refers to the degree to which students report applying previous knowledge to new situations aiming to solve problems, reach decisions or make critical evaluations with respect to standards of excellence (Pintrich & Schunk, 2008; Pintrich, Smith, Garcia, & McKeachie, 1993; Woolfolk, 2007).

**Research Question**

What are the structural relationships, in terms of magnitude and direction of the path/regression coefficients, connecting motivational beliefs in effort and ability with goals orientation and learning strategies?

**Hypotheses**

1. There are no significant relationships between motivational beliefs in effort and ability with goals orientation at the $p = .05$ level. Motivational beliefs in effort and ability would exert no significant influences on learning goal and performance goal.

2. There are significant relationships between goals orientation and learning strategies at the $p = .05$ level. Learning goal would have positive and significant effects on rehearsal, elaboration, organization and critical thinking. Performance goal would have no significant effects on rehearsal, elaboration, organization and critical thinking.

**Method of Study**

Around 200 student teachers from the first or second year Certificate of Education (CE) course of the Institute of Education in Hong Kong were selected for the present cross-sectional empirical study. The questionnaires were administered to a cohort group of CE student teachers and were collected for data analysis. Descriptive statistics, reliability analysis and path analysis (utilizing structural equation modeling technique) would be used for the methodology of statistical data analyses.

**Measurement of the Variables**

**Motivational Beliefs in Effort and Ability**

The participants' motivational beliefs in effort and ability were measured by modifying and adapting the Effort Scale developed by Stipek and Gralinski (1996). The instrument consisted of six items to which the respondents were asked to respond on a five-point rating scale. The adapted instrument contained two subscales: the motivational belief in effort and the motivational belief in ability. The participants were asked to place their perceptions along the rating scale with 1 = 'Strongly Disagree' and 5 = 'Strongly Agree'. Motivational belief in effort was based on three items, including, for example, “I believe that anyone who works hard could be one of the smartest in the class”; “If one works hard, they can do well in academic work”. Motivational belief in ability scale was based on three items, including, for example: “In order to do well in academic work, lack of ability can’t make it”; “I believe that I am able to be the smartest one in class”. The instrument was administered to the participants for data collection.

**Achievement Goals Orientation**

Achievement goal orientations was measured by the Achievement Goal Inventory
developed by Roedel, Schraw, and Plake (1994). This instrument was to measure the attitudes and behaviours that were associated with the learning and performance goal themselves. It contained two subscales: Learning Goal and Performance Goal. There were a total of 17 items each with a five-point Likert scale rating ranging from 5 = ‘Very truly like of me’ to 1 = ‘Not truly like of me’. Sample items of the Learning Goal Orientation were “I enjoy challenging school assignments”; “I am very determined to reach my goals”. Sample items for the Performance Goal Orientation were: “It is important for me to always do better than others”; “I like others to think I know a lot”. The instrument was appropriately adapted and was administered to the participants to respond.

**Learning Strategies**

For the measurement of learning strategies, part of the Motivated Strategy of Learning Questionnaire (MSLQ) developed by Pintrich, et al. (1993), was adapted and used in the present study. The adapted instrument contained 31 items, to be answered on a seven-point scale from 1 = ‘Never true of me’ to 7 = ‘Always true of me’. It was divided into four subscales: rehearsal, elaboration, organization and critical thinking. Sample item for the rehearsal strategy was “I memorize key words to remind me of the important concepts in this class”. Sample item for the elaboration strategy was “I try to relate ideas in this subject to those in other courses whenever possible”. Sample item for the organization strategy was: “When I study the readings for this course, I outline the material to help me organize my thoughts”. For the critical thinking strategy, sample item included: “I often find myself questioning things I hear or read in this course to decide if I find them convincing”. This instrument was adequately adapted and was administered to the participants for data collection.

**Results**

1. **Descriptive Statistics and Correlational Analysis**

Table 1 below indicated the mean, standard deviations and correlations for motivational beliefs in effort and ability, achievement goals and learning strategies. It could be seen that all variables of motivational beliefs in effort and ability, learning goal, performance goal, rehearsal, elaboration, organization and critical thinking were significantly and positively correlated with each other.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tbody>
<tr>
<td>1. Belief in effort</td>
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<td></td>
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<td></td>
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<td>2. Belief in ability</td>
<td>.50</td>
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<td></td>
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</table>
3. Learning goal .36 .37 --
4. Performance goal .17 .19 .28 --
5. Rehearsal .18 .23 .38 .22 --
6. Elaboration .21 .28 .44 .19 .73 --
7. Organization .15 .21 .41 .18 .72 .73 --
8. Critical thinking .16 .24 .38 .19 .73 .83 .69 --

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<tr>
<th></th>
<th>M</th>
<th>SD</th>
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<tr>
<td>3.64</td>
<td>3.53 3.55 3.45 4.29 4.49 4.36 4.24</td>
<td>.72 .60 .50 .61 .93 .87 .93 .89</td>
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</table>

Note: All correlation are significant at the .01 level

2. Reliability Analysis

From Table 2 below, it could be observed that the internal consistencies/reliabilities of the eight subscales under study were all good and satisfactory, ranging from .59 to .87. The coefficient alpha for the subscale (elaboration) was the highest, with alpha = .87. The coefficient alpha for the subscale (motivational belief in ability) was the lowest, with alpha = .59. All the reported result indicated that the instruments used for the present study acquired good and satisfactory psychometric property.

Table 2
Reliability Coefficient Alphas for Motivational Beliefs, Achievement Goals and Learning Strategies Scales

<table>
<thead>
<tr>
<th>Scales</th>
<th>Coefficient Alphas</th>
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<tr>
<td><strong>Motivational Beliefs</strong></td>
<td></td>
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<tr>
<td>Effort</td>
<td>.73</td>
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<tr>
<td>Ability</td>
<td>.59</td>
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<tr>
<td><strong>Achievement Goals Orientation</strong></td>
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</table>
Learning goal .84
Performance goal .73

Learning Strategies

Rehearsal .79
Elaboration .87
Organization .71
Critical thinking .82

3. Path Analysis

From Figure 1, the path coefficient from motivational belief in effort to learning goal was found to be $\gamma = +.36$ (positive and significant) and the path coefficient for motivational belief in ability on performance goal was $\gamma = +.18$ (positive and significant). Next, the path coefficients from learning goal to the four learning strategies: rehearsal, elaboration, organization and critical thinking were respectively: $\beta = +.35$, $\beta = +.44$, $\beta = +.42$, $\beta = +.39$ (all positive and significant). However, the path coefficient from performance goal to rehearsal was found to be $\beta = +.14$ (positive and significant).
Figure 1  The path model showing the effects of motivational beliefs in effort and ability on achievement goals orientation and learning strategies
Discussion

The results of this study supported the view that motivational beliefs in ability and effort had significant influences on the students’ learning strategies via the mediational effect of the achievement goals orientation. From the structural equation analysis of the model concerning the belief in ability and effort, results indicated that a promising model concerning the intercorrelations of motivational beliefs, achievement goal orientations and learning strategies could be established (See Figure 1). The findings were more or less in line with some previous researches (Hau & Salili, 1990, 1996; Hess, Chang & McDevitt, 1987; Salili & Mak, 1988) that motivational belief in effort would lead to learning goal, whereas the motivational belief in ability would lead to performance goal. For students who believe in effort, they would more likely endorse the learning goal orientation. While for students who believe in ability, they would endorse performance goal orientation. These findings supported that Chinese culture, with its emphasis on hard work, appeared to encourage effort attributions and mastery of task. Effort, in fact, was treated as a salient or accessible cause that many Chinese used to explain achievement outcomes (Hong, 2002). It was argued that for students who maintained hard work or exerted effort in achievement situation, might enhance perseverance in the learning process. Besides, such controllable condition was crucial in the success for the mastery of new skills. Therefore, students with belief in effort, who exercised effort attributions, would endorse the learning goal orientation. However, students who maintained ability-attribution, might be inclined to perform better than others. They might also regard themselves smart enough in achieving success through spending lesser effort and perseverance in the learning process. As such, students with motivational belief in ability might endorse the performance goal orientation.

On the other hand, with reference to the framework developed by Weiner (1974, 1986), effort and ability are regarded to be internal constructs. However, the main difference between effort and ability lies in the fact that effort is controllable but not stable, whereas ability is uncontrollable but stable. Looking at this way, it may be argued that individuals who uphold motivational belief in effort, can control (with personal will), their achievement behaviours by adopting the learning/mastery goal orientation, during which they can increase the mastery of “new” tasks and to “increase” their competence. In this fashion, their attributional style in achievement conforms to the controllability characteristic (controlled under their personal will), while simultaneously aligns to the “unstability” characteristic, in which they can master “new” tasks and “increase” their competence. Contrary to those individuals who uphold motivational belief in effort, individuals who believe in ability may think that they cannot “control” their achievement behaviours. They would be more inclined to maintain a
positive judgment of their abilities and to strive to avoid negative judgments by trying to prove ones superiority and competence in competing and outperforming others. In achieving this purpose, their attributional style would conform to the “stability” characteristic (i.e., substantial and concrete judgment and evidence of ones innate ability, which are regarded as “stable” psychological construct). Besides, their lacking view of controlling the achievement process in academic success also conforms to attributional style of “uncontrollability” characteristic.

In line with the above argument, the finding of the present study indicated that the manifestation of the motivational belief in effort might lead students to more learning goal oriented. This might implicate that teachers or educators should cultivate the value of “motivational belief in effort” through school teaching practices, which can be beneficial to the students in fostering the learning goal orientation. If this prediction is correct, then all individuals, not only Chinese, who uphold the attitude of belief in effort would certainly foster the more desirable/adaptive learning goal orientation. In simple words, students who are diligent, hard working, persevering in their studies and willing to spend extra effort, would deserve and/or foster better learning outcomes because of maintaining a desirable/adaptive achievement goal orientation.
References


